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PATENT APPLICATION
Do. No. 9898-204
Client No. SS-16038-US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Jae-Yoon SIM and Jei-Hwan YOO		
Serial No.	09/901,930	Examiner:	Cunningham, Terry D.
Filed:	July 9, 2001	Art Unit:	2816
Confirmation No.	7100		
For:	NEGATIVE VOLTAGE GENERATOR FOR A SEMICONDUCTOR MEMORY DEVICE		

TRANSMITTAL LETTER

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☒ Applicant's Appeal Brief (in Support of Appeal), in triplicate.
☒ PTO Form 2038 authorizing credit card payment of $450.00 filing fee for brief in support of appeal ($340.00) and one month extension of time fee ($110.00).
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Customer No. 20575

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

Todd J. Iverson
Reg. No. 53,057

MARGER JOHNSON & McCOLLOM, P.C.
1030 SW Morrison Street
Portland, OR 97205
503-222-3613

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Date: October 19, 2004

Li Mei Vermilya

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APPELLANT'S BRIEF UNDER 37 CFR § 1.192

This Appeal Brief is in furtherance of the Notice of Appeal filed on 19 July 2004. Appeal is taken from the Office Action mailed on 19 February 2004 (Paper No. 02142004), which finally rejected claims 1-24.

The fees required under §1.17(c) and any required petition for extension of time for filing this Brief and fees therefore are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This Brief is transmitted in triplicate.

This Brief contains these items under the following headings, and in the order set forth below.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

37 CFR §1.192(c) (1)

The present application has been assigned to the following party:

Samsung Electronics Co., Ltd.

416 Maetan-Dong, Paldal-Ku

Suwon-City, Kyunkgi-Do

Republic of Korea.

II. RELATED APPEALS AND INTERFERENCES

37 CFR §1.192(c) (2)

The Board's decision in the present Appeal will not directly affect, or be directly affected, or have any bearing on any other appeals or interferences known to Appellant, or to the Appellant's legal representative.

III. STATUS OF CLAIMS

37 CFR §1.192(c) (3)

1. Claims presented: 1-24
2. Claims withdrawn from consideration but not cancelled: 25-63
3. Claims canceled: NONE
4. Claims pending: 1-24 of which:

a. claims allowed: NONE

b. claims rejected: 1-24

All the rejected claims, namely claims 1-24, are being appealed. The appealed claims are eligible for appeal, having been finally rejected.

IV. STATUS OF AMENDMENTS

37 CFR §1.192(c) (4)

Subsequent to the Office Action mailed on 19 February 2004, which contained a final rejection of the appealed claims, no amendment to the claims has been submitted.

V. SUMMARY OF THE INVENTION

37 CFR §1.192(c) (5)

According to some embodiments of the invention, a voltage generator configured to bias a word line from a boosted voltage having a first polarity to a second voltage having a second polarity includes a first charge pump having an output, and a second charge pump having an output coupled to the output of the first charge pump, wherein the second charge pump is adapted to be controlled by a precharge signal.

VI. ISSUES ON APPEAL

37 CFR §1.192(c) (6)

A. Whether the feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity as recited in claims 1, 7, 14, and 17 is anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 5,367,489 to Park et al. ("Park").

B. Whether claims 1-24 are unpatentable under 35 U.S.C. § 103(a) by Park in view of U.S. Patent No. 5,856,918 to Soneda et al ("Soneda").

C. Whether claims 6, 13, and 24 are indefinite under 35 U.S.C. § 112, second paragraph.

VII. GROUPING OF CLAIMS

37 CFR §1.192(c) (7)

Since all the claims 1-24 have been rejected under both 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a), claims 1-24 form a first group of claims (Group I), which contains the independent claims 1, 7, 14, and 17. The claims in Group I do not stand or fall together.

VIII. ARGUMENT

37 CFR §1.192(c) (8)

A. Park does not anticipate the feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity as recited in the independent claims 1, 7, 14, and 17.

Claim 1 recites, *inter alia*, biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity. Claims 7, 14, and 17 recite similar features.

Park is alleged to teach this feature because "nowhere do the claims state that the [recited] second polarity is different from the [recited] first polarity." The Appellant disagrees. The very use of the terms "first polarity" and "second polarity" require that the first and second polarities be different, any other interpretation is contrary to the plain meaning of the terms.

For example, in claim 7 the Appellant recited "a first charge pumping means" and "a second charge pumping means." Similar to the recited first and second polarities in claim 1, nowhere does claim 7 explicitly state that the recited first charge pumping means must be different from the recited second charge pumping means. However, with respect to the Examiner's interpretation of claim 7 there is apparently no difficulty in understanding that the "first charge pumping means" is distinct from the "second charge pumping means." To the Appellant's knowledge, there are also numerous examples of issued patents where the only distinction made between two objects is by using the recitation of "a first object" and "a second object." In all cases, the implication is that the "first object" is distinctive from the "second object."

As an initial matter, if the recited "first polarity" is interpreted to be different from the recited "second polarity," then it must be agreed that Park fails to teach the feature, for the following reason.

When Park's word line precharge signal transitions from Vpp to 0V, the signal lines G3 and G4 are pumped to ***a level Vpp which is greater than level Vcc*** (FIG. 1B; column 1, line 66 to column 2, line 8; emphasis added). When the word line precharge signal transitions from 0V to Vpp, the ***signal lines G3 and G4 are returned to level Vcc*** (FIG. 1B; column 2, lines 9-18). Park teaches that ***Vpp and Vcc are both positive voltages*** (column 1, lines 66-68; emphasis added). Since Vpp and Vcc are both positive voltages, Vpp and Vcc have the same polarity. These statements accurately reflect the teachings of Kitsukawa (see page 598, section B; and also FIGS. 6 and 7). Similarly, Park FIG. 8 shows that the boosted voltage Vpp of FIGs. 6, 7A, and 7B is always of the same positive polarity (column 13, lines 22 – column 14, line 3).

According to Park's Abstract, "[t]he voltage pumping circuit generates at an initial power-up state a first output voltage which is substantially identical to the memory device source supply voltage. The pumping circuit then pumps the first output voltage up to a second output voltage which is ***higher than*** the first output voltage" (emphasis added).

Consequently, since the output of Park's voltage pumping circuit is always positive, Park fails to teach the recited feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity, if the first and second polarities are interpreted as different. This is essentially admitted in the final Office Action mailed 19 February 2004 (page 4, lines 8-9), where in the discussion of the § 103 rejections it is stated that "the reference to Park et al. fails to explicitly disclose using the alternate arrangement where the charge pump generates a negative voltage."

The central issue here is proper claim interpretation. As explained above, if the recited first polarity is interpreted to be different from the recited second polarity, there can be no dispute that Park fails to teach this feature. However, the untenable position has been taken that the recited feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity "can include both the first polarity and the second polarity being the same."

Claim construction analysis begins with the words of the claim itself. *See* Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). ***All words*** in a claim must be considered in judging the patentability of that claim against the prior art. MPEP 2143.03, *citing* In re Wilson 424 F.2d 1382, 1385 (CCPA 1970), emphasis added.

Since the Appellant has elected to use the terms "first polarity" and "second polarity," it must be assumed that the adjectives "first" and "second" are used to distinguish between the polarities in some way.

If, as is suggested, the first and second polarities could be the same polarity, then there would be no need to use the adjectives "first" and "second." For example, the Appellant could have recited in claim 1 "biasing a word line from a boosted voltage having a polarity to a second voltage having a polarity." If this was the actual feature appearing in claim 1, the polarity associated with the boosted voltage could very well be the same as the polarity associated with the second voltage. Thus, the interpretation that the recited first polarity may be the same as the recited second polarity ignores the teaching of MPEP 2143.03 to consider all words in a claim when judging the patentability of the claim, and renders the adjectives "first" and "second" meaningless.

Furthermore, the words of a claim must be given their plain meaning unless they are defined in the specification. MPEP 2111.01. "First polarity" and "second polarity" are not explicitly defined in the specification. Plain meaning refers to the meaning given to the term by those of ordinary skill in the art. MPEP 2111.01. Unless there is an express intent to impart a novel meaning to the claim terms, the words of the claim are presumed to take on "the ordinary and customary meanings attributed to them by those of ordinary skill in the art." Int'l Rectifier Corp. v. IXYS Corp., 361 F.3d 1363, 1369 (Fed. Cir. 2004); Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 (Fed. Cir. 2003).

The ordinary and customary meaning attributed to the term "polarity" by those of ordinary skill in the art is either "positive" or "negative," especially when the term polarity is used in conjunction with a voltage. Dictionaries are one source for determining the ordinary meaning of a claim term. Texas Digital Sys. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed. Cir. 2002). Webster's Third New International Dictionary (2002) defines "polarity" as "the particular[,] ***either positive or negative state*** (as of a body)[,] with reference to ***the two poles*** or to electrification" (emphasis added). Thus, because those of ordinary skill know that there are only two polarities, either positive or negative, the plain meaning of the terms "first polarity" and "second polarity" is that if the first polarity is positive, the second polarity is negative, or vice versa.

Finally, pending claims must be interpreted consistently with the specification. *See*

MPEP 2111, *citing* In re Prater, 415 F.2d 1393 1404-05 (CCPA 1969). The feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity is ***explicitly*** recited in claims 1, 7, 14, 17 (emphasis added). Reading a claim in light of the specification to interpret features that have an express basis in the claims is permissible. *See* MPEP 2111, *citing* In re Prater, 415 F.2d 1393 1404-05 (CCPA 1969).

The specification states that because most semiconductor memory devices operate from ***positive*** power supplies, the Appellant' back-biasing scheme is described in terms of a ***negative*** voltage (page 5, lines 1-3; emphasis added). However, "negative" is understood to mean simply the ***reverse polarity*** from that applied to a word line during an access operation (page 5, lines 3-4; emphasis added). Thus, the interpretation of the terms "first polarity" and "second polarity" to be the same polarity is inconsistent with the specification.

In all cases, the specification must be examined to determine which of the possible dictionary meanings is consistent with the use of the claim term in the context of the claims and the written description. *See* Int'l Rectifier, 361 F.3d at 1369. The dictionary definition of polarity that was given above is entirely consistent with the teaching from the appellant's specification that immediately precedes this paragraph.

For all the above reasons, the recited feature of "biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity" should be interpreted such that the first and second polarities are different.

Consequently, Park fails to anticipate claim 1 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989). Claims 7, 14, and 17 are not anticipated by Park FIG. 1B for the same reason.

Claims 2-6, 8-13, 15-16, and 18-24 depend from claims 1, 7, 14, and 17, respectively. Consequently, Park also fails to anticipate these claims because Park does not teach every feature inherent in the claims. MPEP 2131.

With regard to claim 2, it recites the feature of a voltage regulator having an input coupled to the output of the first charge pump and an output coupled to the output of the second charge pump.

It is alleged that Park FIG. 7B discloses a first charge pump 130a and a second charge pump 130b. It is further alleged that Park FIG. 6 discloses a regulator 900 that is connected

as recited. To the contrary, it is apparent from Park FIGs. 6 and 7B that while the alleged regulator (clamper 900) may have an input that is coupled to the output of the first charge pump, it cannot have an output that is connected to the output of the alleged second charge pump 130b.

Consequently, for this additional reason Park fails to anticipate claim 2 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989).

B. Claims 1-24 are not obvious in view of the Park/Soneda combination

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park in view of U.S. Patent No. 5,856,918 to Soneda et al ("Soneda"). The Appellant disagrees.

Regarding independent claims 1, 7, 14, and 17, each recites, *inter alia*, biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity.

As explained above with regards to the first issue (issue A), the recited "first polarity" must be interpreted as being different from the recited "second polarity." As explained above, Park fails to teach this feature.

Soneda also fails to teach this feature. Soneda FIG. 4J shows that the booster circuit of FIGS. 2 and 3 produces a boosted voltage that ranges between GND and 4Vcc. Thus, the boosted voltage has only one (positive) polarity. Soneda FIG. 10J shows that the booster circuit of FIGS. 8 and 9 produces a boosted voltage that ranges between GND and -3Vcc. Thus, the boosted voltage has only one (negative) polarity. Consequently, since the output of Soneda's voltage pumping circuits always have the same polarity, Soneda fails to teach the recited feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity.

It is stated that "Park et al fails to explicitly disclose using the alternate arrangement wherein the charge pump generates a negative voltage." Soneda is only being relied upon for the teaching that a negative voltage may be produced just as easily as a positive voltage. Although that may be true, Park makes it clear in his Abstract that the source supply voltage Vcc and the boosted voltage Vpp have the same polarity. Thus, if Park's positive voltage generator was converted to the negative voltage regime as suggested by Soneda, then the

voltages Vpp and Vcc would still both have the same negative polarity. Regardless of whether Park's or Soneda's charge pump produces an initial boosted voltage that is positive or negative, it has been shown that Park and Soneda do not teach or suggest that the boosted voltage is ever biased to a voltage having the opposite polarity of the boosted voltage.

Thus, because neither Park nor Soneda, ***either alone or in combination***, teach the recited feature of biasing a word line from a boosted voltage having a first polarity to a second voltage having a second polarity, the Park/Soneda combination fails to establish a *prima facie* case of obviousness for claims 1, 7, 14, and 17. MPEP 2143.03.

Claims 2-6, 8-13, 15-16, and 18-24 depend from one of the independent claims 1, 7, 14, and 17. If an independent claim is nonobvious, then any claim depending therefrom is also nonobvious. MPEP 2143.03, *citing* In re Fine, 837 F.2d 1071 (Fed. Cir. 1988).

C. Claims 6, 13, and 24 are not indefinite under 35 USC 112, second paragraph

Claims 6, 13, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention. It is alleged that since the claim is not claiming a memory circuit, it is not understood what a "word line precharge signal" would be with respect to a "voltage generator". The Appellant disagrees.

Claims 6, 13, and 24 depend from claims 1, 7, and 17, respectively. Claim 1 recites "[a] voltage generator configured to bias ***a word line***" and "the second charge pump is adapted to be controlled by ***a precharge signal***" (emphasis added). Claims 7 and 17 recite similar features. Claim 6 further specifies that the precharge signal recited in claim 1 is a "word-line precharge signal." Claims 13 and 24 recite similar features to claim 6.

It is not alleged that "[a] voltage generator configured to bias a word line," as recited in claim 1, is indefinite. Neither is it alleged that "the second charge pump is adapted to be controlled by a precharge signal" is indefinite. It is only apparently when the "precharge signal" becomes a "word-line precharge signal," as recited in claim 6, does the indefiniteness occur. The Appellant submits that if it is definite enough to say that the second charge pump is adapted to be controlled by a precharge signal (which could be ***any*** type of precharge signal), then an additional recitation that limits the precharge signal to a ***specific*** type precharge signal (such as a word-line precharge signal) does not render the claim indefinite.

Furthermore, independent claim 14 recites a voltage generator configured to bias a ***word line*** and that the second charge pump is adapted to be controlled by a ***word-line precharge signal***. Claim 14 is not rejected under 35 U.S.C. §112. Thus, it is not reasonable to reject the same feature that appears elsewhere in dependent claims 6, 13, and 24.

It is alleged "that a 'voltage generator' would not generally ***have*** a 'word line precharge signal' per se (emphasis added). However, nowhere in claims 6, 13, 24 is it required that the voltage generator ***have*** a word line precharge signal (emphasis added). Claims 1, 7, and 17, upon which claims 6, 13, and 24 depend, recite that the second charge pump is ***adapted to be controlled by*** a precharge signal.

Definiteness of claim language must be analyzed, not it a vacuum, but in light of: a) the content of the particular application disclosure; b) the teachings of the prior art; and c) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made (MPEP 2173.02).

With regard the element a), the content of the application disclosure is replete with indications that the claimed voltage generator may be controlled by an ***external*** word line precharge signal (emphasis added). See, e.g., page 5, lines 22-24; "[p]recharge commands are typically external commands such as Row Precharge, Auto Precharge, All Banks Precharge, etc." These commands and signals are for "a Synchronous Dynamic Random Access Memory (SDRAM) device (page 5, lines 20-22).

With regard to element b), the Park reference teaches that voltage pumping circuits are used in conjunction with semiconductor memory devices. See, e.g., the title of Park's patent. Park also teaches that voltage compensation circuits for use with semiconductor memory devices may receive enable signals corresponding to any of the various operational modes of the semiconductor memory device (column 3, lines 50-68).

With regard to element c), those of ordinary skill are quite aware that word-lines and word-line precharge signals are associated with semiconductor memory devices.

It has been stated that "[i]t would be clear to one skilled in the art [that] the "word line precharge signal" would be exclusively for a memory circuit, which has not been recited" (emphasis in original). To the contrary, the express language of claims 1, 6, 7, 13, 17, and 24 does not indicate that the word-line precharge signal must be part of the recited voltage generator, merely that the recited second charge pump is ***adapted to be controlled by*** the

word-line precharge signal (emphasis added). Furthermore, it was made abundantly clear by the applicants that the word-line precharge signal is an externally applied signal, and Park himself teaches that his voltage compensation circuit may be controlled by an enable signal "represent[ing] any of various signal corresponding to operational modes of the memory device ... such as a row address strobe (RAS) signal or column address strobe (CAS) signal" (column 3, lines 64-68).

Given the above reasons, claims 6, 13, and 24 are not indefinite under 35 U.S.C. § 112, second paragraph.

D. Conclusion

The Appellant requests favorable consideration by the Board. If any questions remain, please call the undersigned at (503) 222-3613.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

Todd J. Iverson
Reg. No. 53,057

MARGER JOHNSON & McCOLLOM, P.C.
1030 SW Morrison Street
Portland, OR 97205
503-222-3613

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Date: October 19, 2004

Li Mei Vermilya

IX. APPENDIX

37 CFR §1.192(c) (9)

The text of the claims on appeal (1-24) is:

1. (Previously presented) A voltage generator configured to bias a word line from a boosted voltage having a first polarity to a second voltage having a second polarity, the voltage generator comprising:

a first charge pump having an output; and

a second charge pump having an output coupled to the output of the first charge pump, wherein the second charge pump is adapted to be controlled by a precharge signal.

2. (Previously presented) The voltage generator of claim 1, further comprising:

a voltage regulator having an input coupled to the output of the first charge pump and an output coupled to the output of the second charge pump.

3. (Previously presented) The voltage generator of claim 1, wherein the output of the first charge pump is connected directly to the output of the second charge pump.

4. (Previously presented) The voltage generator of claim 3, further comprising: a voltage regulator having an input coupled to the outputs of the first and second charge pumps.

5. (Previously presented) The voltage generator of claim 1, further comprising:

a level detector having an input coupled to the output of the first charge pump.

6. (Previously presented) The voltage generator of claim 1, wherein the precharge signal is a word-line precharge signal.

7. (Previously presented) A voltage generator configured to bias a word line from a boosted voltage having a first polarity to a second voltage having a second polarity, the voltage generator comprising:

first means for pumping charge to a voltage source; and

second means for pumping charge to the voltage source, wherein the second means for pumping charge is adapted to be controlled by a precharge signal.

8. (Previously presented) The voltage generator of claim 7, wherein the first means for pumping charge has an output connected directly to an output of the second means for pumping charge.

9. (Previously presented) The voltage generator of claim 7, further comprising:

means for regulating the voltage source.

10. (Previously presented) The voltage generator of claim 9, wherein:

the first means for pumping charge has an output connected directly to an output of the second means for pumping charge; and

the means for regulating the voltage source has in input coupled to an output of the first means for pumping charge and an output of the second means for pumping charge.

11. (Previously presented) The voltage generator of claim 9, wherein the means for regulating the voltage source has in input coupled to an output of the first means for pumping charge and an output coupled to an output of the second means for pumping charge.

12. (Previously presented) The voltage generator of claim 7, further comprising:

means for detecting the voltage level of the voltage source.

13. (Previously presented) The voltage generator of claim 7, wherein the voltage source is a voltage source for negatively biasing a word line.

14. (Previously presented) A voltage generator configured to bias a word line from a boosted voltage having a first polarity to another voltage having a second polarity, the voltage generator comprising:

an oscillator;

a first charge pump having an input coupled to the oscillator and an output for generating a first voltage responsive to an oscillating signal from the oscillator;

a voltage regulator having an input coupled to the output of the voltage generator and an output for generating a second voltage responsive to the first voltage; and

a second charge pump having an output coupled to the output of the voltage regulator, wherein the second charge pump is adapted to be controlled by a word-line precharge signal.

15. (Previously presented) The voltage generator of claim 14, further comprising:

a level detector having an input coupled to the output of the first charge pump and an output coupled to the oscillator.

16. (Previously presented) The voltage generator of claim 14, wherein the second charge pump is adapted to pump a predetermined amount of charge to the second voltage responsive to the word-line precharge signal.

17. (Previously presented) A method for biasing a word line from a boosted voltage having a first polarity to another voltage having a second polarity comprising:

controlling a voltage generator responsive to a precharge signal.

18. (Previously presented) The method of claim 17, wherein:

the voltage generator comprises a first charge pump and a second charge pump; and

controlling a voltage generator responsive to a precharge signal comprises activating the second charge pump responsive to the precharge signal.

19. (Previously presented) The method of claim 18, wherein the first charge pump generates a first voltage.

20. (Previously presented) The method of claim 19, wherein activating the second charge pump responsive to the precharge signal comprises coupling charge from the second charge pump to the first voltage.

21. (Previously presented) The method of claim 19, further comprising: regulating the first voltage, thereby generating a second voltage.

22. (Previously presented) The method of claim 21, wherein activating the second charge pump responsive to the precharge signal comprises coupling charge from the second charge pump to the second voltage.

23. (Previously presented) The method of claim 18, wherein activating the second charge pump responsive to the precharge signal comprises supplying a predetermined amount of charge from the second charge pump.

24. (Previously presented) The method of claim 17, wherein the precharge signal is a word-line precharge signal.